Measurement Microphones

For Precision Sound Level and Array Measurements

- Sound Power Testing
- Engine Noise Analysis
- Environmental Noise Analysis
- Near-field Acoustic Holography
- Building Noise Studies
- Acoustic Chamber Testing
- Sound Pressure Mapping

The Vibration Division of PCB® Piezotronics, Inc. offers a variety of traditional, externally polarized condenser microphones and modern, prepolarized condenser microphones. These devices are well-suited for precision sound level and acoustic array measurements.

PCB precision microphones are available from 1/8 to 1-inch diameters to cover a variety of applications, and are designed to operate over a wide range of temperatures and humidity levels. Microphone preamplifiers are small, rugged units with a very low inherent noise floor, a large dynamic range, and a bandwidth extending over a broad frequency range.

As with all PCB® instrumentation, this equipment is complemented with toll-free applications assistance, 24-hour customer service, and is backed by a no-risk policy that guarantees satisfaction or your money refunded.

PCB PIEZOTRONICS INC.
VIBRATION DIVISION

Total Customer Satisfaction Guaranteed

Precision Modern Prepolarized and Traditional Externally Polarized Condenser Microphones

- Proven ruggedized design
- Exceptional performance in high humidity
- Individually tested for performance
- Operate from ICP® sensor power (prepolarized microphones)
- Meet IEC and ANSI standards
- Can be utilized in Type 1 systems

A wide variety of traditional externally polarized and modern prepolarized free-field, pressure, and random incidence precision condenser microphones are available from PCB. Externally polarized models operate from a 200 V power source, while prepolarized models can operate from low-cost, constant current (2 to 20 mA) ICP® sensor signal conditioners and coaxial cables. Prepolarized microphones can also be interchanged with similar accelerometer set-ups.

1/8 inch
Model 377A50

1/4 inch
Model 377A01

1/2 inch
Model 377A02

1 inch
Model 377A42

The Series 377 incorporates microphones of the highest quality, accurate enough to be used for laboratory testing, and rugged enough for field use in Type 1 system measurements.

Array Microphones

- Low per-channel cost
- Powered from ICP® sensor signal conditioners
- Interchangeable with with ICP® accelerometers
- Integrated preamplifier

Model 130D21
(10–32 Connector)

Model 130D20
(BNC Connector)

The Series 130 Array Microphones provide a cost-effective method for large-channel count sound pressure measurements. They are powered by standard ICP® sensor signal conditioners. Typical applications include sound pressure mapping, acoustic mode analysis, near field acoustic holography, and vibro-acoustic testing.

Models 130D20 and 130D21 are available with the Transducer Electronic Data Sheet (TEDS) option, compliant with IEEE P1451.4.

Array kits are available, complete with patch panel, cables, and signal conditioners, for multi-channel applications. PCB also offers versatile, precision-made array microphone test stands and flexible pattern arrays.

2 x 4 Array Arrangement

3 x 3 Array Arrangement

Model 379A01
Array Stand

Array Microphones with Integral Preamplifier

Model Number	130D20	130D21
Microphone Diameter	1/4"	1/4"
Response	Free-field	Free-field
Sensitivity (± 3 dB at 250 Hz)	45 mV/Pa	45 mV/Pa
Frequency Response (± 1 dB)	100 Hz to 4 kHz	100 Hz to 4 kHz
Frequency Response (-2, +5 dB typical)	20 Hz to 15 kHz	20 Hz to 15 kHz
Dynamic Range (10 Hz to 10 kHz, ref. 20 µPa)	<40 to >122 dB	<40 to >122 dB
Polarization Voltage	0 V	0 V
Connector	BNC	10-32

Precision Condenser Microphone Cartridges

Model Number	377A01	377A02	377A03	377A10	377A11	377A20	377A40	377A41
Diameter	1/4"	1/2"	1/2"	1/4"	1/2"	1/2"	1/2"	1/2"
Response	Free-field	Free-field	Free-field [2]	Pressure	Pressure [3]	Random Incidence	Free-field	Free-field
Open Circuit Sensitivity (at 250 Hz)	4 mV/Pa	50 mV/Pa	50 mV/Pa	1.6 mV/Pa	50 mV/Pa	50 mV/Pa	14.5 mV/Pa	44.5 mV/Pa
Frequency Response (±2 dB)	4 Hz to 80 kHz	3.15 Hz to 20 kHz	4 Hz to 16 kHz	4 Hz to 70 kHz	3.15 Hz to 10 kHz	3.15 Hz to 12.5 kHz	3.15 Hz to 40 kHz	3.15 Hz to 20 kHz
Polarization Voltage	0 V [1]	0 V [1]	0 V [1]	0 V [1]	0 V [1]	0 V [1]	200 V	200 V
Dynamic Range - 3% Distortion Limit [4]	166 dB	148 dB	>146 dB	170 dB	148 dB	148 dB	>160 dB	>146 dB
Dynamic Range - Cartridge Thermal Noise [4]	30 dB (A)	14.5 dB (A)	15 dB (A)	34 dB (A)	16 dB	16 dB	20 dB (A)	15 dB (A)
Operating Temperature	-40 to 120 ºC (-40 to 248 ºF)	-40 to 120 ºC (-40 to 248 ºF)	-40 to 80 ºC (-40 to 176 ºF)	-40 to 120 ºC (-40 to 248 ºF)	-40 to 120 ºC (-40 to 248 ºF)	-40 to 120 ºC (-40 to 248 ºF)	-40 to 150 ºC (-40 to 302 ºF)	-40 to 150 ºC (-40 to 302 ºF)

Notes: [1] Prepolarized [2] Supplied with Model 079A01 random incidence adaptor [3] Can also be used as a random incidence microphone [4] re 20 µPa

Preamplifiers

- Small and rugged
- Low noise floor
- Large dynamic range
- Wide frequency bandwidth
- Stainless steel housing

ICP™ Preamplifiers for Prepolarized Microphones

Models 426B03 and 426D01 are low-noise, general-purpose prepolarized microphone preamplifiers powered by any constant current (2 to 20 mA) ICP® sensor power supply. Both models are supplied with TEDS capability and are designed to be used with prepolarized microphones.

Model 426B03
1/4" ICP™ Preamplifier

Model 426D01
1/2" ICP™ Preamplifier

Traditional Preamplifiers

Model 426A30 is a rugged 1/2-inch diameter preamplifier optimized for use with externally polarized microphones. It is compatible with microphones as defined in the international standard IEC 61094, and connects to a 200 V power supply requiring a 7-pin cable with Lemo connectors.

Model 426A30
Preamplifier

Model 426A31 is a 1/4-inch diameter preamplifier with an integral 3 m (10 ft) cable that terminates with a 7-pin Lemo connector.

Preamplifiers

Model Number	426B03	426D01	426A31	426A30
Diameter	1/4"	1/2"	1/4"	1/2"
Gain (Attenuation)	-0.25 dB	-0.08 dB	-0.25 dB	-0.25 dB
Frequency Response (± 0.2 dB)	2 Hz to 100 kHz	6 Hz to 126 kHz	2 Hz to 200 kHz	0.9 Hz to 120 kHz
Electrical Noise (A-weight)	<2.5 µV	<5 µV	<2.2 µV	<4.5 µV
Electrical Noise (Flat) [1]	<6 µV	<8 µV	<6 µV	<7 µV
Output Voltage	8 V pk	8 V pk	50 V pk	14 V pk
Constant Current Excitation	2 to 20 mA	2 to 20 mA	N/A	N/A
Operating Temperature	-30 to 60 ºC (-22 to 140 ºF)	-40 to 65 ºC (-40 to 149 ºF)	-30 to 70 ºC (-22 to 158 ºF)	-40 to 85 ºC (-40 to 185 ºF)
Output Connector	10-32 Jack	BNC Plug	Integral Cable	7-pin Lemo
TEDS IEEE P1451.4	Yes	Yes	No	No

Notes: [1] 20 Hz to 20 kHz

ICP® Sensor Signal Conditioners

- Battery powered
- Line-powered
- DC-powered
- Modular style
- Multi-channel

Model 480C02
Battery Powered
ICP® Sensor
Signal Conditioner

Series 481A
16-channel Signal Conditioner

Microphone Power Supply

- 0 to 200 volt polarization voltage
- Extended battery life (40 hours)
- 0 to 50 dB gain
- Drives long cables (500 ft, 152 m)
- Compatible with ICP® sensors
- Selectable flat (Z), A, and C-weighting

Model 480A25
Microphone Power Supply

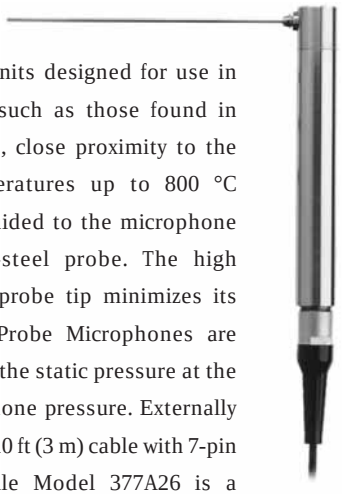
377A42	377A50	377A51	377A53
1"	1/8"	1/4"	1"
Free-field	Pressure	Pressure	Pressure
48 mV/Pa	1.0 mV/Pa	0.4 mV/Pa	45 mV/Pa
2.6 Hz to 20 kHz	6.5 Hz to 140 kHz	10 Hz to 20 kHz	2.6 Hz to 8 kHz
200 V	200 V	200 V	200 V
>146 dB	178 dB	>192 dB	>146 dB
10 dB (A)	40 dB (A)	31 dB (A)	10 dB (A)
-40 to 150 ºC (-40 to 302 ºF)	-40 to 150 ºC (-40 to 302 ºF)	-40 to 150 ºC (-40 to 302 ºF)	-40 to 150 ºC (-40 to 302 ºF)

Model 485B36
USB Dual Channel
ICP® Sensor
Signal Conditioner

USB Dual Channel ICP® Sensor Signal Conditioner

Model 485B36 USB dual channel ICP® sensor signal conditioner provides current-regulated power for two ICP® sensor input channels. The compact unit operates from power obtained from a computer's Universal Serial Bus (USB) port. Additionally, the sensor bias voltage is decoupled from the measurement signals, which are outputted via a 3.5 mm stereo jack.

Probe Microphones



Probe Microphones are compact units designed for use in difficult measurement situations, such as those found in small cavities, harsh environments, close proximity to the sound source, or in high temperatures up to 800 °C (1472 °F). The acoustic signal is guided to the microphone through a detachable, stainless-steel probe. The high acoustic input impedance of the probe tip minimizes its influence on the acoustic field. Probe Microphones are internally compensated to equalize the static pressure at the probe tip with the internal microphone pressure. Externally polarized Model 377A25 includes a 10 ft (3 m) cable with 7-pin Lemo connector termination, while Model 377A26 is a prepolarized version with BNC jack output connector.

In-line "A-weighting" Filter

The Model 426B02 in-line A-weighting filter is powered by constant current excitation and is compatible with ICP™ microphone preamplifiers. When using this filter, however, a minimum of 4 mA excitation current is required of the ICP® sensor signal conditioner or readout device, which incorporates ICP® sensor power.

Model 426B02
A-weighting Filter

Accessories (please consult factory for full line)

Nose Cone

Windscreen

Adaptor

Swivel Head Adaptor

Microphone Clamp

Preamplifier Holder

Microphone Cable

Precision Calibrators

PCB offers calibrators for microphones that meet IEC and ANSI standards. These units are easy to use and available with optional adaptors for use with a variety of microphone diameters. These units are lightweight, portable, and battery operated.

Precision Calibrators

Model Number	CAL200	CAL250	394A40
Microphone Sizes	1/4"*, 1/2"	1/8"*,1/4"*,1/2",1"	1/8",1/4",1/2",1"*
Frequency	1 kHz ± 1%	250 Hz ± 0.8%	250 Hz ± 0.5%
Output Level (re 20 µPa)	94 dB,114 dB ± 0.2 dB	114 ± 0.1 dB	114 ± 0.08 dB
Barometric Pressure Compensation	None	Automatic	Manual
ANSI S1.40-1984 Compliant	Yes	Yes	N/A
IEC 60942 Class 1	Yes	Yes	Yes

* With optional adaptors

Model CAL200
Acoustic Calibrator

Model CAL250
Acoustic Calibrator

Model 394A40
Pistonphone

Total Customer Satisfaction:

- **No minimum charges**
- **No restocking fees**
- **24-hour SensorLine℠ for technical assistance**
- **Satisfaction guaranteed or your money refunded**

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The Vibration Division of PCB® Piezotronics, Inc. specializes in the development, application, and support of shock and vibration sensors, microphones, impact hammers, piezoelectric actuators, and dynamic strain sensors for acceleration measurements, acoustic testing, and structural testing requirements. This product focus, coupled with the strengths and resources of PCB, permits the Vibration Division to offer exceptional customer service, 24-hour technical assistance, and a **Total Customer Satisfaction** guarantee.

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